

REMARKS

Claims 1, 4, 6-7, 9, 11-13, 15-18, 30-36, 40-41, and 43-44 are pending in the present application. Claims 1, 4, 7, 11, 15, 30, 32, 36, 40, and 41 are amended herein. No new matter is inserted into the application. Entry of the above amendments is earnestly solicited. An early and favorable first action on the merits is earnestly solicited.

***Status of the Claims***

In the Advisory Action dated March 17, 2003, the Examiner writes that the Reply after Final filed on February 28, 2003 was entered into the record and considered. However, the Examiner states in the Advisory Action that the Reply does not place the application into condition for allowance, and that, for purposes of Appeal, claims 1-4, 6-7, 9-18, 30-36, 40-41, and 43-44 remain rejected in the present application. The Examiner is reminded that claims 2, 3, 10 and 14 were canceled in the Reply after Final. Since it was entered into the record, only claims 1, 4, 6-7, 9, 11-13, 15-18, 30-36, 40-41, and 43-44 are pending in the present application. The Examiner is respectfully requested to clarify the record accordingly.

***Conclusion***

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully

requested to contact Kristi L. Rupert, Ph.D. (Reg. 45,702) at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By 

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Attachment(s): VERSION WITH MARKINGS TO SHOW CHANGES MADE

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows:

**Claim 1.** (Four Times Amended) A nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an  $\alpha(1\rightarrow6)$  bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,
- (h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, [and]

(i) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained [isolated] from a [plant selected from the group consisting of] leguminous plant [plants, lamiaceous plants, and monocotyledon,] with a combination of a PCR primer selected from the group consisting of SEQ ID NO:9, SEQ ID NO:15, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, and SEQ ID NO:58 and a PCR primer selected from the group consisting of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:17, and SEQ ID NO:53, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of [any one of] (a) or [to] (b) [(h)], in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(j) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a leguminous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:12, SEQ ID NO:19, SEQ ID NO:65, and SEQ ID NO:68 and a PCR primer selected from the group consisting of SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:21, and SEQ ID NO:70, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (c) or (d), in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(k) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a lamiaceous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:71 and SEQ ID NO:73 and a PCR primer

selected from the group consisting of SEQ ID NO:72 and SEQ ID NO:74,  
wherein said nucleotide sequence is hybridizable with a nucleotide  
sequence complementary to the nucleotide sequence of (e) or (f), in  
0.9 M NaCl, 0.09 M citric acid at 65°C, and

(1) a nucleotide sequence obtainable from a polynucleotide  
which is amplifiable via the RACE process from a nucleic acid  
obtained from a monocotyledon with a PCR primer selected from the  
group consisting of SEQ ID NO:77 and SEQ ID NO:78, wherein said  
nucleotide sequence is hybridizable with a nucleotide sequence  
complementary to the nucleotide sequence of (g) or (h), in 0.9 M  
NaCl, 0.09 M citric acid at 65°C.

**Claim 4.** (Three Times Amended) The isolated nucleic acid according to claim 1, wherein the leguminous plant in (i) is broad bean.

**Claim 7.** (Three Times Amended) The isolated nucleic acid according to claim 1, wherein the leguminous plant in (j) is soybean.

**Claim 11.** (Three Times Amended) The isolated nucleic acid according to claim 1, wherein the lamiaceous plant in (k) is Japanese artichoke.

**Claim 15.** (Three Times Amended) The isolated nucleic acid according to claim 1, wherein the monocotyledon in (1) is a gramineous plant.

**Claim 30.** (Five Times Amended) A chimera gene comprising:  
a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an  $\alpha(1\rightarrow6)$  bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,
- (h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, [and]

(i) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained [isolated] from a [plant selected from the group consisting of] leguminous plant [plants, lamiaceous plants, and monocotyledon,] with a combination of a PCR primer selected from the group consisting of SEQ ID NO:9, SEQ ID NO:15, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, and SEQ ID NO:58 and a PCR primer selected from the group consisting of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:17, and SEQ ID NO:53, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of [any one of] (a) or [to] (b) [(h)], in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(j) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a leguminous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:12, SEQ ID NO:19, SEQ ID NO:65, and SEQ ID NO:68 and a PCR primer selected from the group consisting of SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:21, and SEQ ID NO:70, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (c) or (d), in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(k) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a lamiaceous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:71 and SEQ ID NO:73 and a PCR primer

selected from the group consisting of SEQ ID NO:72 and SEQ ID NO:74, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (e) or (f), in 0.9 M NaCl, 0.09 M citric acid at 65°C, and

(1) a nucleotide sequence obtainable from a polynucleotide which is amplifiable via the RACE process from a nucleic acid obtained from a monocotyledon with a PCR primer selected from the group consisting of SEQ ID NO:77 and SEQ ID NO:78, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (g) or (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C, and a promoter linked thereto.

**Claim 32.** (Five Times Amended) A plasmid comprising a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an  $\alpha(1\rightarrow6)$  bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,



(d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,

(e) a nucleotide sequence of SEQ ID NO:5,

(f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,

(g) a nucleotide sequence of SEQ ID NO:7,

(h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, [and]

(i) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained [isolated] from a [plant selected from the group consisting of] leguminous plant [plants, lamiaceous plants, and monocotyledon,] with a combination of a PCR primer selected from the group consisting of SEQ ID NO:9, SEQ ID NO:15, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, and SEQ ID NO:58 and a PCR primer selected from the group consisting of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:17, and SEQ ID NO:53, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of [any one of] (a) or [to] (b) [(h)], in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(j) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a leguminous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:12, SEQ ID NO:19, SEQ ID NO:65, and SEQ ID NO:68 and a PCR primer selected from the group consisting of SEQ ID

NO:13, SEQ ID NO:14, SEQ ID NO:21, and SEQ ID NO:70, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (c) or (d), in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(k) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a lamaceous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:71 and SEQ ID NO:73 and a PCR primer selected from the group consisting of SEQ ID NO:72 and SEQ ID NO:74, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (e) or (f), in 0.9 M NaCl, 0.09 M citric acid at 65°C, and

(l) a nucleotide sequence obtainable from a polynucleotide which is amplifiable via the RACE process from a nucleic acid obtained from a monocotyledon with a PCR primer selected from the group consisting of SEQ ID NO:77 and SEQ ID NO:78, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (g) or (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C.

**Claim 36.** (Five Times Amended) A method for metabolic modification, which comprises introducing a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a

D-galactosyl group through an  $\alpha(1\rightarrow6)$  bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,
- (h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, [and]
- (i) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained [isolated] from a [plant selected from the group consisting of] leguminous plant [plants, lamiaceous plants, and monocotyledon,] with a combination of a PCR primer selected from the group consisting of SEQ ID NO:9, SEQ ID NO:15, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, and SEQ ID NO:58 and a PCR primer selected from the group consisting of SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:17, and SEQ ID NO:53, wherein said

nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of [any one of] (a) or [to] (b) [(h)], in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(j) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a leguminous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:12, SEQ ID NO:19, SEQ ID NO:65, and SEQ ID NO:68 and a PCR primer selected from the group consisting of SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:21, and SEQ ID NO:70, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (c) or (d), in 0.9 M NaCl, 0.09 M citric acid at 65°C,

(k) a nucleotide sequence obtainable from a polynucleotide which is amplifiable from a nucleic acid obtained from a lamiaceous plant with a combination of a PCR primer selected from the group consisting of SEQ ID NO:71 and SEQ ID NO:73 and a PCR primer selected from the group consisting of SEQ ID NO:72 and SEQ ID NO:74, wherein said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (e) or (f), in 0.9 M NaCl, 0.09 M citric acid at 65°C, and

(l) a nucleotide sequence obtainable from a polynucleotide which is amplifiable via the RACE process from a nucleic acid obtained from a monocotyledon with a PCR primer selected from the group consisting of SEQ ID NO:77 and SEQ ID NO:78, wherein said

nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of (g) or (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C, into a host organism or a cell thereof, so that the content of raffinose family oligosaccharides in the host organism or the cell thereof is changed.

**Claim 40.** (Three Times Amended) An isolated nucleic acid comprising (i) a polynucleotide having a sequence that encodes a protein having an amino acid sequence selected from the group consisting of SEQ ID NOs:2, 4, 6, or 8 or (ii) a polynucleotide having a sequence complementary to said sequence[, or (iii) a polynucleotide isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said polynucleotide hybridizes to the polynucleotide (i) or (ii) in 0.9 M NaCl, 0.09 M citric acid at 65°C].

**Claim 41.** (Three Times Amended) An isolated nucleic acid comprising (i) a polynucleotide having a nucleotide sequence selected from the group consisting of SEQ ID NOs:1, 3, 5, or 7 or (ii) a polynucleotide having a sequence complementary to said sequence[, or (iii) a polynucleotide isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said polynucleotide hybridizes to the

polynucleotide (i) or (ii) in 0.9 M NaCl, 0.09 M citric acid at 65°C].